

Are central banks too risk-averse?¹

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Abstract

This paper asks whether central banks are too conservative investors. Since reserves are held for foreign exchange intervention, central banks have prioritised holding safe assets that are liquid in episodes of market turmoil. Moreover, reserves were historically small and have only recently become so large that they exceed what could plausibly be needed for intervention. Several governance factors that bias central banks toward being too conservative are identified. These include a principal-agent problem between the central bank and the Ministry of Finance; the need to ensure sufficient asset management experience among board members and the senior management; and a bias towards a steady stream of profits arising from the profit distribution rules. To offset these problems, governance changes may be necessary.

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1. Introduction

As a consequence of the Great Financial Crisis (GFC), central banks are becoming increasingly important and sophisticated as investors. Before the crisis, their balance sheets were typically small and their significance stemmed largely from their role as monetary policymakers. However, the large increases in their foreign exchange (FX) reserves over the last two decades have made them important market participants.

Central banks' prominence as investors has also been amplified by the fact that they have increased the diversification of their assets and are now active in many more market segments than before the GFC. This development has been driven by the size of their reserves, which in many cases far exceed what is necessary for monetary policy purposes and therefore has induced central banks to think of broadening the range of assets in which they invest.

Another factor underpinning the diversification is the global search for yield, as asset managers seek to escape the very low levels of interest rates introduced by central banks in an effort to boost economic activity and stave off deflation. Nevertheless, despite these developments, central banks remain conservative investors, compared with pension funds and insurance companies in the private sector and other public sector investors.

The increased size of central banks FX reserves and their growing diversification suggests that some central banks allocate their portfolios in ways increasingly similar to those of sovereign wealth funds (SWFs). However, they do so without formally changing their investment processes, focusing instead on holding short-term liquid instruments and not taking advantage of long-term return opportunities of alternative asset classes.

The objective of this paper is twofold: (i) to discuss how central bank reserve management procedures and practices have evolved over the last two decades; and (ii) to question whether central banks are highly risk-averse as investors and, if so, which factors may have caused them to be so.

The remainder of this paper is organised as follows. Section 2 analyses the evolution of central bank asset allocation over the last 20 years. A central finding is that central banks have diversified their portfolios since the crisis struck. Section 3 compares central banks' asset allocations with those of other institutional investors. It concludes that while central banks have, like many other investors, "reached for yield" in recent years, they remain conservative. Section 4 focuses on whether central banks should diversify their portfolios further in the post-quantitative easing (QE) era. Here, the key finding is that the case for central banks to diversify more away from fixed income is strong and valid across a range of scenarios for the global economy. Section 5 turns to whether the current level of reserves is adequate given the current macroeconomic environment in which floating exchange rates are common. The main conclusion of this section is that many countries have a level of reserves that exceeds what traditionally has been considered as adequate. Section 6 explores some possible reasons as to why central banks are so risk-averse, focusing on principal/agent problems, the relative lack of asset management expertise at the board and senior management levels that are responsible for determining risk tolerance, and profit distribution rules. Section 7 looks at ways to overcome this bias through various institutional changes. Finally, Section 8 concludes.

Before proceeding, it is useful to note that central banks manage three different pools of assets: (i) FX reserves (which have risen sharply in emerging markets following the Asian financial crisis at the end of the 1990s), (ii) pension fund assets and (iii) assets (largely fixed income assets) acquired as a consequence of QE. These pools of assets serve different purposes, have varied investment styles and are associated with different liabilities. This paper considers FX reserves management where central banks have considerable room in terms of diversification and investment across asset classes, regions and currencies.

2. Changes in central bank reserve allocations in recent decades

Central bank FX reserve management practices have evolved considerably in recent decades. Twenty years ago, central banks had zero (or negligible) allocations to asset classes such as corporate bonds, asset-backed securities, emerging market debt and equity. The bulk of their assets was held in cash, bank deposits and short-duration government bonds from advanced economies. On the investment side, they were largely concerned about liquidity as FX reserves were considered as an instrument to intervene in FX markets when episodes of market pressures occurred and to provide liquidity to the financial sector during periods of domestic financial stress.

Two decades later the picture has changed. Most notably, FX reserves managed by central banks have grown to unprecedented levels: with more than USD 11 trillion of reserves, they constitute one of the largest institutional investor segments together with insurance and pensions funds. Given that the bulk of these assets are held in the fixed income markets of a few advanced economies, central banks' investment decisions can move markets. Furthermore, via QE central banks from advanced economies have been intervening heavily in global markets with the explicit goal of keeping interest rates low and to dampen volatility, which makes risky assets such as equities more attractive, with the intention of boosting economic activity. A few central banks (including the Bank of Japan) also hold domestic equities in addition to foreign government and corporate bonds.

Today, central banks invest across a wider range of asset classes, including spread products in fixed income markets such as corporate bonds and asset-backed securities, and increasingly outside the fixed income space such as listed equity. According to the *UBS Annual Reserve Manager Survey*, which has been tracking central banks asset allocation since 1998, more than half of central banks can invest in corporate bonds and asset-backed securities (ie MBS and ABS) and more than a third can invest in emerging market debt and equity (Graph 1).

Trends in approved asset classes
Percentage of respondents

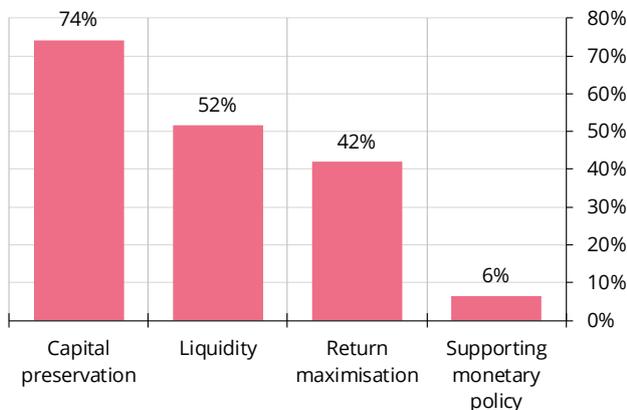
Graph 1

Asset class	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
Supranationals	94	95	93	90	89	94	82	87	76	70	68	70	72	70	74	63	62	60	62	54	63	60
Sovereign eurobonds	85	86	89	93	92	90	78	73	64	68	65	66	66	64	60	60	58	58	61	60	66	66
US agencies	85	76	74	83	74	49	54	69	55	65	71	84	86	84	82	76	78	75	71	62	68	54
Inflation-protected bonds	73	62	76	70	61	49	48	40	44	47	45	38	33	28	16	9	na	na	na	na	na	na
Covered bonds	45	43	48	53	34	43	40	45	30	38	40	53	58	50	48	44	38	35	37	34	28	12
Bank debt	45	43	48	40	42	41	26	33	20	31	29	48	44	48	41	21	24	21	26	20	16	4
Corporates	61	57	56	48	42	43	34	33	31	29	26	38	41	40	38	38	32	28	22	20	15	10
MBS / ABS	58	57	52	40	39	25	20	22	37	27	38	46	52	44	39	39	27	22	17	19	12	2
Emerging market debt	36	24	26	30	21	18	12	11	22	24	16	16	10	na								
Equities	39	24	30	33	26	18	16	24	18	19	14	18	22	18	5	3	2	na	na	na	na	na
Private equity	18	5	19	na																		
Hedge funds	15	0	11	na																		

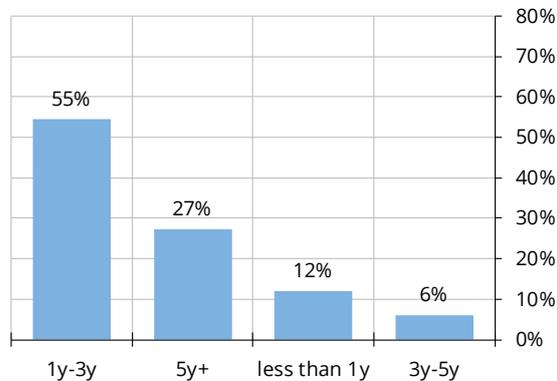
Source: UBS Annual Reserve Manager Seminar Survey, various years.

The primary objectives of central banks when investing their reserves are capital preservation, liquidity and return. Capital preservation and liquidity dominate, with the return objective considered important but only as long as the two primary targets are fulfilled. This prudent asset allocation is considered appropriate by central banks given their mandate: an ample reserve of liquid funds might be needed should crises occur, and large losses could have serious reputational costs. In addition to that, central banks have a relatively short investment horizon, which generally implies a pro-cyclical investment behaviour with potentially negative effects on long-term returns.

What are your primary investment objectives?



What is your investment horizon?



Source: UBS Annual Reserve Manager Seminar Survey, 2019.

The increasing diversification of the last two decades reflects several factors, including the dramatic rise in FX reserves, particularly in emerging market economies. It was, however, the sharp drop in interest rates following the start of the GFC in 2008 that prompted central banks to join other institutional investors in the “search for yield”. The bulk of FX reserves has traditionally been invested in government bonds denominated in USD, EUR, JPY and a few other currencies. Most of these markets were affected by the extraordinary monetary policy measures adopted by central banks to stave off the risk of deflation and support recovery. As a result, since 2009 nominal returns on cash and short duration government bonds across these markets have been very low and, in some cases, negative. In 2009–18, cash generated an average yearly return of 0.7%; the return on a short-duration government bond portfolio was around 1%. A central bank’s portfolio invested across the major currencies in a 50/50 cash/short duration bond portfolio has generated a return of around 1% since 2009, well below the level of the previous decade (of around 4%).

Capital preservation can be defined in various ways but, at a minimum, investors want to protect capital in real terms to maintain its purchasing power. Since 2009, investing only in cash and short government bonds – assuming an inflation rate of around 2% or slightly lower – has not allowed central banks to protect the real value of their reserves.

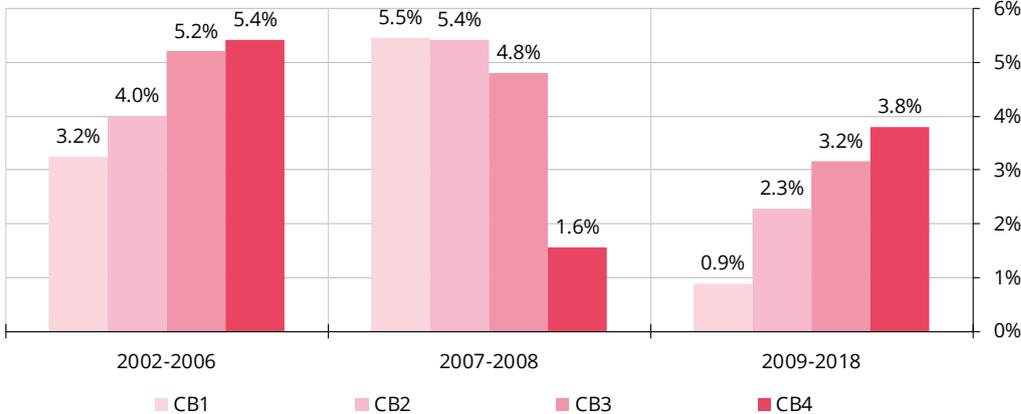
Reducing cash and increasing duration in government bonds boosted returns. Long government bonds have generated good returns over the last few decades as a result of the secular fall in long-term interest rates. However, since 2009 their returns have also been falling: about 3.2% compared with nearly 6% before 2008 and with the additional risk of investing in an expensive asset class. According to data provided by the US Treasury Department, duration into spread products and US Treasuries held by official institutions has been rising since 2009, providing empirical evidence for such a trend (Jones (2018)).

By broadening the investable universe, central banks have been able to capture higher returns and gain diversification benefits. Since 2009, investment-grade corporate bonds generated an annual return of nearly 5% and emerging market

bonds in hard currency more than 5%. Global equities rewarded investors with an annual return of more than 9%. Over this period, a central bank portfolio with 60% invested in cash and short duration bonds and 40% diversified in (investment grade) corporates, asset-backed securities, supranationals and long-duration bonds generated a return of above 2%, more than doubling the return of the cash/short duration bond portfolio and protecting the real value of the reserves. By diversifying even further in more risky asset classes, such as emerging market debt and equities, central banks were able to generate returns above 4%, thus fulfilling all their investment objectives of capital protection, liquidity and return enhancement.

Returns of CB1 to CB4 portfolios over 2009–18
Percentage

Graph 3



Source: UBS Asset Management. Please refer to Table 1 “Central banks’ portfolio with allocation to alternatives” for more information on the composition of sample central bank portfolios CB1-4. 2019 YTD includes data up to May 2019.

Central banks have often increased duration when diversifying into equities. Traditionally the returns on (long-term) government bonds and equities have been negatively correlated, thus extending duration on fixed income has been considered as a way to protect the portfolio in case of falling equity prices. The negative correlation between equity and fixed income returns provides important diversification benefits to central banks’ portfolio, which have large allocations to fixed income assets and are heavily exposed to interest rate risk. Central banks have simply adopted the same investment strategy as many other institutional investors such as pension funds. In this sense, over the last decade FX reserve management has evolved towards common practices among institutional investors.

3. How does central bank asset allocation compare with that of other institutional investors?

Central banks’ asset allocation varies considerably across regions and institutions, reflecting different levels of reserves and different economic, financial and institutional conditions. Broadly speaking (and based on anecdotal evidence), central banks in the Americas and Africa are the most conservative, with some limited

diversification within fixed income. They only rarely venture into riskier asset classes such as emerging market debt or equity.

At the other end of the risk spectrum, Asian central banks have been diversifying aggressively over the last several years. This is largely a reflection of a high level of reserves, which are often well above the level considered as adequate for precautionary reasons, and the high level of national saving prevailing in these economies. They often diversify into equities and a few also invest into illiquid alternative asset classes such as real estate.

European and Middle Eastern central banks stand in the middle between America and Asia, but with a recent increasing trend towards more diversification, particularly into equities. There are some notable exceptions – for instance, the Swiss National Bank, which has a very high level of reserves and a relatively high allocation to equities.

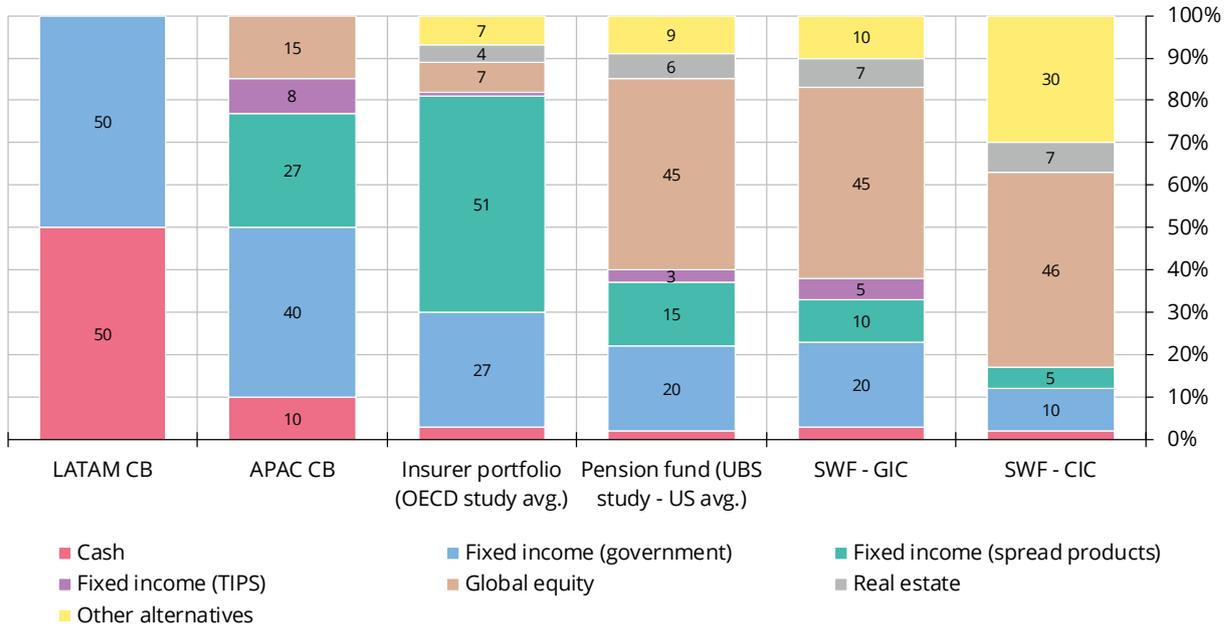
Despite the trend toward increased diversification, in general the investment profile of central banks remains conservative when compared with other institutional investors such as pension funds or insurance funds. Two main differences stand out: (i) central banks still have a relatively small allocation to equities; and (ii) have an almost zero allocation to alternative asset classes such as hedge funds, real estate and infrastructure.

Pension funds generally invest 40% into equities and increasingly invest into alternative asset classes. Insurance funds invest the bulk of the portfolio into fixed income largely because of regulations. But they also have equities and, more importantly, alternative asset classes.

When compared with SWFs, the asset allocation of central banks appears to be even more risk-averse, which is not surprising given the long-term investment horizon of these institutions and the fact that they have been created precisely to diversify reserves aggressively in global capital markets. However, it is also worth noting that some SWF's assets are sometimes run by central banks (eg Norway), showing that central banks have the ability and skills to manage more diversified portfolios when they are given such a mandate from their sponsoring governments.

Asset allocation of selected institutional investors
Percentage of total assets

Graph 4



Source: UBS Asset Management on OECD data. GIC is the SWF in Singapore in charge of diversifying excess reserves in global markets. China Investment Corporation (CIC) is the largest Chinese SWF.

4. Should central banks increase diversification further in the post-QE era?

Diversification paid off in the QE era as credits and equities produced good returns with low volatility due to the secular fall in long-term interest rates and extraordinarily expansionary monetary policy. Central banks that diversified 10–20% of their reserves into equities enjoyed very good risk-adjusted returns.

An intriguing question is whether this trend will continue as the world moves into the post-QE era. As global growth remains steady and interest rates are gradually normalised, cash and short-duration government bonds are expected to generate returns in excess of 2% over the next five years. Global government bonds are expected to be the worst-performing asset class in this scenario as long-term interest rates rise gently from historically lows. Credits and other spread products also generate lower returns than in the past decade as interest rate rises and spreads start from historical lows. Despite current high valuations in certain markets, global equity is expected to generate good returns, well above those in fixed income assets but slightly lower than during the last decade.

In these market conditions, a portfolio including only fixed income assets is likely to generate returns below 2%. While this is better than the returns experienced in the QE years due to higher policy rates, it is below the expected rate of inflation. In such a scenario, diversifying into equities will boost returns above 3%, thus beating inflation and providing reserve managers with real returns.

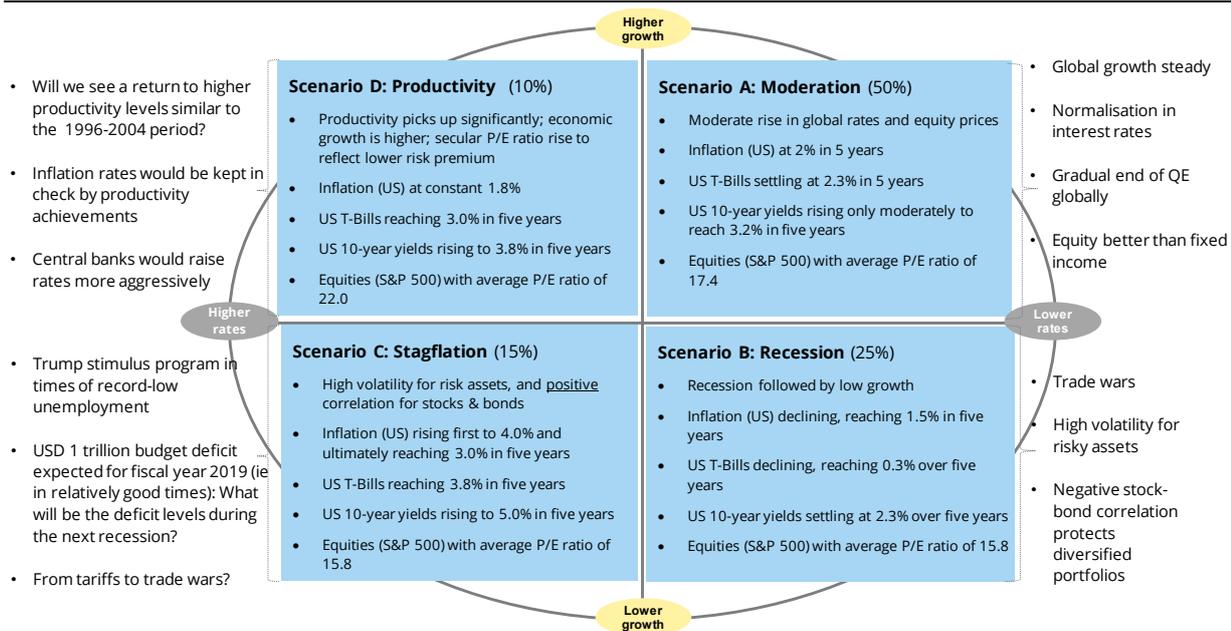
Should the global economy suffer a slowdown or a recession, interest rates would likely fall again to (close to) zero and QE would be resumed. Central banks would be once again challenged to protect the real value of their reserves given their large allocations to government bonds issued by advanced economies. The search for yield would resume.

Should central banks therefore further expand their investment universe as has been done by other institutional investors? From a purely asset allocation perspective, the case for adding alternatives to further diversify reserves is strong. Listed equity is currently considered attractive not in absolute terms but relative to fixed income. There is much uncertainty over the future pace of the global economy following 10 years of (weak) recovery, the potential negative impact of the gradual normalisation in policy rates and the gradual withdrawal of QE. The likelihood of a slowdown or even recession in the United States is rising.

Graph 5 shows possible scenarios for the global economy over the medium to long term with different combinations of growth levels and yields. Furthermore, Table 1 shows the hypothetical returns of different asset classes and portfolios across different scenarios based on UBS valuation models.

Inflation, growth, yields & valuation: four scenarios

Graph 5



Source: UBS Asset Management.

The table indicates how central banks' portfolios, including selected alternative asset classes (ie real estate, hedge funds and infrastructure), would perform across these scenarios. In the base case, maintaining more than 50% of the portfolio to fixed income assets and adding 15% of alternative asset classes would boost returns in both absolute and risk-adjusted terms. These selected alternative asset classes (private equity is excluded to reduce the reputational risk arising from investing in specific private companies) not only provide a source of additional returns but also improve the risk-return profile of the portfolio. In a recession scenario, returns are lower but still positive as the fixed income component of the portfolio compensates for the losses experienced in the riskier equity and alternatives.

Portfolios diversified into alternatives would also perform better in a stagflation scenario. This is the worst scenario for those central banks that have diversified into equities, as the traditional negative correlation between the returns on fixed income and listed equity would turn positive.

Overall, the case for further diversification, including alternatives for central banks, is strong, particularly as the global economy is likely to shift to a new regime characterised by a lower return on fixed income and higher volatility.

Central banks' portfolio with allocation to alternatives*

Table 1

		CB1	CB2	CB3	CB4	CB5a	CB5b	CB5c	CB5d
Cash		50%	10%	10%	10%	10%	10%	10%	10%
GGB 1-3		50%	50%	30%	30%	20%	25%	25%	25%
GGB				10%	10%	5%	5%	10%	5%
Corporate Bond			10%	10%	8%	8%	8%	5%	6%
TIPS			10%	10%	8%	8%	8%	5%	6%
Securitisied			10%	10%	8%	8%	8%	5%	6%
Supranationals			10%	10%	8%	8%	8%	5%	6%
EMD Hard Curr				10%	3%	3%	3%	3%	3%
EMD Local Curr									
Global Equity					15%	15%	10%	15%	15%
Real Estate					0%	5%	5%	7%	8%
Private Equity									
Hedge Funds					0%	5%	5%	5%	5%
Infrastructure					0%	5%	5%	5%	5%
Gold									
Commodity									
Total		100%							
		CB1	CB2	CB3	CB4	CB5a	CB5b	CB5c	CB5d
Historic	Yearly Return	2.20%	3.02%	3.81%	4.21%	5.11%	4.78%	5.09%	5.18%
	Std Dev	0.74%	1.86%	2.57%	2.92%	4.58%	3.96%	4.68%	4.92%
	Return/Std. dev	2.95	1.62	1.48	1.44	1.12	1.21	1.09	1.05
	Minimum rolling yearly Return	0.22%	-1.06%	-1.86%	-7.53%	-15.81%	-12.99%	-16.60%	-17.62%
BaseCase	Yearly Return	2.36%	2.73%	3.18%	3.84%	4.39%	4.04%	4.36%	4.45%
	Std Dev	1.2%	2.6%	3.0%	4.0%	4.7%	4.0%	4.6%	4.7%
	Return/Std. dev	1.97	1.04	1.05	0.96	0.94	1.00	0.95	0.95
Recession	Yearly Return	1.6%	2.4%	2.9%	2.5%	2.5%	2.6%	2.4%	2.5%
	Std Dev	1.2%	2.0%	2.2%	3.5%	4.8%	3.9%	4.9%	5.1%
	Return/Std. dev	1.34	1.19	1.32	0.73	0.53	0.66	0.50	0.48
Stagflation	Yearly Return	2.3%	1.8%	2.0%	1.7%	2.2%	2.2%	2.0%	2.2%
	Std Dev	1.2%	3.1%	3.7%	5.8%	6.8%	5.8%	6.7%	6.8%
	Return/Std. dev	1.81	0.58	0.55	0.30	0.32	0.37	0.30	0.32
Productivity	Yearly Return	0.8%	1.3%	2.2%	2.8%	3.7%	3.3%	3.8%	3.9%
	Std Dev	1.2%	2.2%	2.4%	3.0%	3.5%	3.0%	3.4%	3.5%
	Return/Std. dev	0.73	0.60	0.93	0.96	1.05	1.08	1.11	1.11

*GGB 1-3 is a short-duration government bond portfolio invested into USD (65%), EUR (25%), JPY (5%) and GBP (5%); GGB is a long-duration government bond portfolio with the same currency breakdown. Both portfolios hedged in USD. Historical returns are for 2002–19 May. Expected returns are for 2019–24.

Source: UBS Asset Management.

5. Central banks' capacity to bear risk

As noted above, central banks are more conservative investors than pension funds and insurance companies but also more than other public sector entities. Nevertheless, since the onset of the financial crisis, they have diversified their portfolios to include higher-yielding but riskier assets.

Why might central banks be so conservative? Traditionally, central banks operated with fixed exchange rates and needed FX reserves to sell against domestic currency in periods of speculative outflows. Since pressures could develop very quickly and unexpectedly, it was essential to hold the reserves in a highly liquid form so that they quickly could be used for intervention in currency markets. In practice, this meant that central banks held safe short-term USD treasury debt.

Over time, however, two factors have reduced the relevance of this consideration. First, few central banks now operate monetary policy with a fixed exchange rate. With inflation targeting and similar strategies, in which the exchange rate only matters to the extent it risks pushing inflation away from the target, central banks' need to hold FX reserves for intervention purposes has been sharply reduced. Nevertheless, some commodity exporting economies, for instance those in the Gulf, still maintain fixed exchange rates with the US dollar; this has not prevented them from aggressively diversifying accumulated reserves via SWFs. In the Gulf, central banks hold a relatively low level of reserves.

Second, FX reserves are now in many cases far larger than what could plausibly be needed for intervention. Following the Asian financial crisis, central banks in emerging economies decided to increase their FX reserves to be able to better withstand occasional episodes of market pressures. This was made all the easier to achieve following the onset of the GFC after the collapse of Lehman Brothers in September 2008, when the Federal Reserve and central banks in other advanced economies cut interest rates to unprecedentedly low levels and adopted unconventional monetary policy to provide further stimulus. This led to large inflows in emerging economies, which central banks often absorbed to mitigate the upward pressure on their exchange rates.

The consequence has been large increases of their FX reserves that are now exceptional by any standard. The literature on what is the adequate level of reserves is vast and different approaches can be adopted (see Castelli and Scacciavillani (2012)). As a rule of thumb, a level of reserves at around 10% of GDP is considered as adequate to cover the FX transaction needs of the government and private sectors and to have a buffer against unforeseen events such as a sudden drop in cross-border capital flows or stress in the financial sector. As one can see from Graph 6, many countries have reserves well above this threshold.

The reduced need to hold foreign reserves for exchange market intervention, coupled with the huge increase in reserves, means that many central banks by now have become in all but name sovereign wealth funds. Nevertheless, they often retain their past investment strategies and focus on short-term liquidity rather than long-term capital returns.

FX reserves as a proportion of GDP in selected economies
Percentage

Graph 6

Country	GDP (current \$bn)	FX reserves (\$bn)	FX reserves as % of GDP
Switzerland	704	762	103%
Lebanon	56	43	81%
Singapore	361	277	79%
Saudi Arabia	782	487	65%
Algeria	180	114	58%
Czech Republic	242	145	58%
Thailand	487	193	40%
Bulgaria	65	26	40%
Botswana	19	7	39%
Mauritius	14	5	38%
Cambodia	25	8	34%
Jordan	42	14	33%
Israel	370	112	30%
Malaysia	354	96	26%
Peru	225	61	26%
Croatia	61	16	26%
Oman	82	20	25%
Japan	4,972	1,202	23%
Kuwait	141	31	23%
Korea	1,619	379	22%
China	13,407	3,140	22%
Iceland	26	6	21%
Philippines	331	70	21%
UAE	425	85	21%
Russia	1,631	346	20%
Angola	107	24	20%
Poland	586	108	18%
Brazil	1,868	359	17%
Qatar	192	31	17%
Vietnam	241	37	15%
Tunisia	40	6	15%
Colombia	333	45	14%
Norway	435	60	14%
Mexico	1,223	165	14%
Chile	298	38	14%
India	2,717	385	14%
Azerbaijan	45	6	13%
Latvia	35	4	12%
South Africa	7	43	12%
Indonesia	1,022	124	11%
Bangladesh	288	32	11%
Ghana	65	6	11%
Uganda	28	3	11%
Kazakhstan	171	17	10%
Turkey	766	83	9%
Sweden	551	53	9%
New Zealand	203	19	8%
Argentina	518	50	8%
Nigeria	397	29	7%
United Kingdom	2,829	127	4%
Canada	1,711	77	4%
Australia	1,418	58	4%
Spain	4	52	3%
Italy	2,072	38	2%
Belgium	533	10	2%
Austria	458	7	1%
Germany	4,000	60	1%
France	2,775	38	1%
Estonia	30	0	1%
Greece	219	2	1%
Netherlands	913	5	1%

Source: UBS Asset Management, OECD. Figures for GDP from the International Monetary Fund and figures for FX reserves from the World Bank.

To conclude this section, it is worth noting that central banks are better able to shoulder risk than private sector asset managers. This is because in an emergency they can operate temporarily with little or even negative capital. A financial firm that experienced large losses would soon find counterparties disengaging and customers withdrawing business. If the losses were sufficiently large, the firm would find itself frozen out of the markets and unable to survive. Central banks, by contrast, are monopoly suppliers of domestic currency and are always in position to execute payments. Moreover, there are no legal reasons why insolvent central banks cannot continue to operate (as several have done), in contrast to private institutions that would be resolved in such a situation.

6. Why are central banks so risk-averse?

Nevertheless, central banks seem to be excessively risk-averse. Three factors may play a role: (i) a principal/agent problem may exist, (ii) the board responsible for setting the investment strategy and risk tolerance may lack investment expertise and experience, and (iii) profit distribution rules may reduce the scope for central banks to withstand losses.

6.1 Principal/agent problems

Excessive caution may reflect a principal/agent problem. This arises when the agent (in this case the central bank) makes decisions on behalf of the principal (in this case the treasury), but is motivated to act in its own best interests, which may be contrary to those of its principal. Such problems can arise when the two parties have different interests and the principal cannot be sure that the agent, who holds more information, is acting in the principal's best interest.

Since central bank profits reduce the needs for treasuries to finance government expenditures by raising distortionary taxes, treasuries are naturally keen for the central bank to generate returns similar to those of private sector asset managers, which requires it to assume similar risks.

For the central bank, however, the risk-return trade off may appear different. It may release quarterly profit/loss statements to the public, which often are regarded as newsworthy by the media. Reports of losses, even if rare and also experienced by many private sector investors, may be used by the press to argue that the central bank is incompetent. Furthermore, many central banks believe that the effectiveness of their monetary policy depends on their announcements being credible and they being seen as competent. Excessive media attention to occasional short-term losses is therefore undesirable. As a consequence, central banks may structure their portfolios to avoid such losses, at the cost of lower long-term profits.

6.2 Lack of investment expertise in central bank boards and senior management

Reputational considerations may also be important to a central bank's board and senior management. The board typically must approve the central bank's investment strategy and determine its risk tolerance on the advice of the central bank's senior

management. Central bank boards often consist of prominent members of society, drawn from the legal and accounting professions, academia, labour unions, or from retired politicians or civil servants. However, they are rarely drawn from those with expertise in asset management. Similarly, members of senior central bank management also rarely have extensive professional experience in asset management. Since the main tasks of central banks are to conduct monetary policy and, in some cases, to supervise banks, those that rise to the top of these institutions typically do so through these routes rather than through managing the FX reserves.

Given the private reputational risks associated with presiding over a central bank experiencing losses on its investment portfolio, and the associated risk to the credibility of the institution, it is not difficult to see that board members and members of the senior management will err on the margin of safety in establishing investment guidelines. As a consequence, the central bank may not seek to earn a market return on its FX reserves even if the treasury wishes it to do so.⁴

6.3 Profit distribution rules

Another factor that can induce central banks to be excessively cautious is the profit distribution rules. These are typically set in central bank legislation and therefore not always easy to change. Uncertainty about the size of future profit transfers to the treasury is a problem for the fiscal authorities that must prepare long-term projections of government revenues. With distributions paid from current profits, central banks can come under pressure to ensure steady income and to avoid losses that may prevent the central bank from transferring profits every year. This can tilt the central bank's investment strategy in the direction of holding relatively safe assets that generate sure, but small, returns.

7. Dealing with excessively cautious central banks

To overcome the problems mentioned above, governance changes may be necessary.

7.1 Clarifying the central bank act

Central bank boards and senior management may attach greater weight to the effects on their reputation and credibility of negative publicity arising from occasional large losses on their portfolios, and may therefore adopt more conservative investment strategies than desired by their principals. This may be all the easier since central bank acts often provide no guidance about how funds should be invested.

Turning to monetary policy for a moment, there is much agreement that inflation has been lower and more stable in recent decades because central bank acts were rewritten to clarify that price stability was a primary objective of policy. With a clear legal remit and political backing, central banks have been free to focus on this objective, raising the likelihood of success.

⁴ This raises the issue of the appropriate degree of transparency in central bank asset management, an area in which practices vary across regions and countries. See IMF (2014) for a review of central banks' transparency standards.

This suggests that spelling out central banks' investment objectives in legislation might also be desirable. Of course, it may not be possible to make clear in detail what the objectives are. However, phrases such as "reserves not necessary for foreign exchange market purposes should be invested for long-term capital gain" or that "in managing its investments, the central bank should adopt principles broadly similar to those of other long-term asset managers in the public and private sectors" might be helpful. Clarifying society's preferences in legislation provides legitimacy to the central bank's asset management decisions and reduces the risk to its reputation and credibility of occasional capital losses.

From this point of view, the recent *Revised guidelines for foreign exchange management* (IMF (2014)) was too cautious to heighten the focus on long-term returns. The revised guidelines also do not adequately address pro-cyclical portfolio behaviour, which is one implication of excessive risk aversion by central banks. Given the large pool of assets managed by central banks, their investment behaviour is likely to amplify market movements, particularly during periods of falling asset prices (Jones (2018)).

There are several examples of such investment behaviour by central banks. For instance, following the GFC, central banks reduced by half their deposits with commercial banks, thus amplifying the liquidity crunch of the international banking system. During the euro area fiscal crisis, several central banks cut their exposure to peripheral government bonds as credit rating agencies reduced the sovereign debt ratings of these countries. Other official institutions with a much more diversified asset allocation and low risk aversion, for instance SWFs, bought equities when other investors were selling, thus contributing to provide liquidity to the market.

In these cases, there was a clear conflict between the goal of central banks to maintain stability in the financial system during periods of financial stress and the procyclical behaviour of central banks.

This conflict could resurface in the future. For instance, should inflation surprise on the upside and force central banks to tighten monetary policy by more than expected, the impact on the government bond market could be large, tempting central banks to cut losses and shift assets into cash to protect their portfolios.

7.2 Governance and investment committees

Another way to overcome the risk of an excessively cautious investment approach is to delegate decision-making to an investment committee. Again, a comparison with monetary policy is warranted. While monetary policy decisions historically were taken by the central bank governor (unless the central bank lacked independence, in which case they were set by the minister of finance), in the last two decades monetary policy committees (MPCs) have been increasingly adopted. The hallmark of these is that the members – who are appointed for three- to five-year terms – comprise a combination of senior central bank staff and "outsiders" who are selected based on their expertise. As a consequence, monetary policy decisions are not in the direct control of the central bank.

The benefit of outsiders is that they may be less prone to group think, which is always a risk in a central bank. While differences in remuneration levels between the public and private sectors may make it difficult to attract experts with asset management experience from the private sector to senior positions in central banks,

a temporary appointment may be more attractive. Indeed, the Bank of England's MPC often attracts private sector economists.

In this regard, the experience of SWFs is important. The best run SWFs are those where the responsibilities of the sponsoring government, the principal and the SWFs' management, the agent, are clearly defined and separate. The sponsoring government is in charge of defining the risk and return expectations. This does not require it to be prescriptive in terms of individual asset classes, regions etc, but rather by indicating what level of risk is considerate acceptable. According to this governance model, the sponsoring government defines a "reference portfolio", ie a simple combination of listed liquid equity and fixed income. The SWFs' management will be in charge of defining the investment policy within those parameters, maintaining a certain discretion in portfolio decisions including the selection of asset classes. The SWF's management could also include illiquid asset classes if this improves the risk-return trade-off when compared with the reference portfolio.

7.3 Profit rules

Changing profit rules may also be helpful. Currently, central banks typically repatriate some fraction of their annual profit to the ministry of finance. If the ministry values a highly predictable stream, the result may be that the central bank aims for secure, but low, profits.

To avoid this, some device that allows the central bank to smooth profits over time might be helpful. For instance, the central bank could pay the annual profits into a buffer, held by the central bank (or perhaps even by the treasury itself or a new institution), from which profits could be paid at a regular rate. An alternative might be for the central bank to pay out a fixed fraction – such as the expected return – of the portfolio. The pay-out rate could then be adjusted regularly in light of some objective criteria. This is effectively the logic followed by foundations, university endowments and SWFs.

Needless to say, any change of this type could have important legal and accounting implications that would need to be considered.

8. Concluding remarks

This paper has sought to shed light on whether central banks are too conservative as investors. Central banks' risk aversion, which exceeds that of most private sector investors (and other public sector investors), is seen largely as reflecting historical circumstances. In particular, since reserves have been held to permit FX intervention, central banks have put a premium on holding assets that are highly liquid even in circumstances of market turmoil. Central banks' reserves have also in many cases been relatively small and have only recently grown to such an extent that they exceed what could plausibly be needed for intervention purposes.

A number of institutional and governance factors that may bias central banks toward being conservative investors are identified. These include a principal/agent problem that can arise between the central bank and the ministry of finance; the need to ensure that board members and senior central bank management have sufficient asset management experience; and a potential bias towards a steady stream of profits

arising from the rules determining the distribution of profits. The main conclusions are that central banks are plainly in a position to raise returns by assuming more risk, that some changes in governance may make them more prone to do so, and that their ability to shoulder risks is greater than that of many private sector investors.

Overall, it seems appropriate for central banks to reconsider whether their current risk-return trade-offs are appropriate in light of the size of their reserves and to address any low risk bias identified, for instance by adding more asset management expertise at the board and senior management level, set better incentives to resolve any principal-agent problem and improve governance on the investment side. The experience of SWFs, institutions created to accelerate diversification of reserves, particularly with regards to governance, incentives and the ability to attract and retain financial expertise, should be looked at by central banks.

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